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Math, 3

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Barbie Bungee Lab Report

My group members and I dropped our Barbie doll to collect data about how far she would fall when attached to a rubber band bungee cord and dropped from a specific height. To collect this data we attached a certain number of rubber bands to our Barbie, and then dropped her from a variety of heights to observe the distance that she fell. Based on this data we were able to judge how many rubber bands were needed based on the height from which we would drop her. We started with one rubber band and dropped Barbie. The first three trials she fell an average of 17 inches. We continued to add rubber bands to her bungee cord to evaluate the distance at which she fell. The general trend was an increase of approximately 10 inches drop for each rubber band added.

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| --- | --- | --- | --- | --- | --- | --- |
| Number of Rubber Bands | 1 | 2 | 3 | 4 | 5 | 6 |
| Trials (inches) | 17, 17, 17.5 | 24, 27, 26 | 37, 38, 38 | 47, 49, 50 | 57, 59, 60 | 69, 70, 73 |
| Mean (inches) | 17.16 | 25.6 | 37.6 | 48.6 | 58.6 | 70.6 |

On the graph the numbers on the x axis are the number of rubber bands and the y axis is the number of inches Barbie fell. After collecting the data we used the first point on our graph to create an equation in point slope form to trace our line of fit. Our equation was: y=18+10.44(x-1) For our equation we rounded our mean point for using one rubber band from 17.16 to 18 to better fit the data. Using the slope formula we calculated the slope as 10.44. In parentheses the x represents the number of rubber bands. We used this method because it is the fastest and you only need to know a point on the line and the rate of change. We decided to use 17 rubber bands for the final jump by plugging the 4.9 meter height of the stairwell into y for our equation and then found what x would be if y was 4.9.

When we dropped Barbie from the top of the stairwell she tumbled downward almost reaching the floor without suffering trauma (hitting her head). She immediately bounced upward and we reeled her in. Ultimately our prediction of the number of rubber bands needed (17) was correct. The only setbacks we faced were accurately measuring the distance Barbie fell when dropped from the top of a chair. Because Barbie fell so quickly, deciding exactly where she fell on ruler was often difficult. Overall, though our equation worked very well in accurately predicting the number of rubber bands we would need for Barbie’s final drop. If I could redo the experiment, the only thing I would think to improve would be to let the students test run their estimated number of rubber bands from the top stairwell, this way if Barbie hit her head we would have the opportunity to revise our predictions and reassess the number of rubber bands needed.